IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Donald W. Verser et al.	§	Confirmation No.: 2662
	§	
	§	Group Art Unit: 1796
Serial No.: 10/699,095	§	
	§	Examiner: Lu, C. Caixia
Filed: October 31, 2003	§	
	§	
For: Separation of Polymer Particles and Vaporized Diluent in a Cyclone	§	Atty. Docket: CPCM:0016 210441US00

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February 28, 2008	**/Floron C. Faries/**
Date	Floron C. Faries

REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41 AND IN RESPONSE TO THE EXAMINER'S ANSWER MAILED DECEMBER 10, 2007 AND TO CORRECTED EXAMINER'S ANSWER MAILED DECEMBER 28, 2007

This Reply Brief is being filed pursuant to 37 C.F.R. § 41.41 and in response to the Examiner's Answer mailed on December 10, 2007 and the Corrected Examiner's Answer mailed on December 28, 2007. Specifically, this Reply Brief addresses the Examiner's continuing pattern of misinterpretation of the cited art and the pending claims. However, in the interest of brevity, Appellants summarize the present issues and address certain points raised in the Examiner's Answer. In view of Appellants' attempt to avoid repetition in this Reply, Appellants respectfully request that the Board consider Appellants' complete arguments set forth in the previously filed Appeal Brief.

The Examiner rejected all three independent claims 1, 28, and 37 under two separate grounds of rejection. Appellants address both grounds of rejection below.

First Ground of Rejection - 35 U.S.C. § 103(a)

In the Office Action, the Examiner rejected claims 1, 15, 28-31, 33, and 36-42 under 35 U.S.C. § 103(a) as being unpatentable over Kendrick et al. (U.S. Patent No. 6,204,344) in view of Hanson (U.S. Patent No. 5,597,892). However, the cited *Kendrick reference is not prior* art with regard to the present claims because the present claims have an earlier effective filing date than Kendrick.

Kendrick

Based on the face of the Kendrick reference (U.S. Patent No. 6,204,344), the Kendrick filing date is May 18, 1999, and the apparent priority date is March 19, 1999. Consequently, as stated, Kendrick is not prior art with regard to the present claims. Thus, the present rejection, which is based on a combination of the Kendrick and Hanson '892 references, should be withdrawn, and the claims allowed.

Present Claims

The present claims are fully supported by the parent Hottovy, U.S. Patent No. 6,239,235, which has a filing date July 15, 1997. *See, e.g.*, Hottovy, col. 2, lines 11-14 and 60-67; col. 3, lines 7-9 and 40-59; col. 4, lines 32-36; col. 5, lines 6-11; Hanson '341, col. 3, lines 15-28; col. 4, lines 9-12. No present claims require support from information

added in the present continuation-in-part filed October 31, 2003. Moreover, the parent (Hottovy '235) incorporates by reference Hanson (U.S. Patent No. 4,424,341) (hereinafter "Hanson '341") which can support the present claims. *See* 37 C.F.R. § 1.57(f).

Incorporation of Hanson '341

The Examiner stated that "the only portion incorporated from Hanson to Hottovy is the high pressure flash design" because Hottovy '235 states that this "high pressure flash design is broadly disclosed in Hanson and Sherk, U.S. Patent. No. 4,424,341 (Jan. 3, 1984), the disclosure of which is hereby incorporated by reference." *See* Examiner's Answer, pages 6-7. Appellants respectfully disagree. Appellants believe that the entire disclosure of the Hanson '341 patent is incorporated by reference. The incorporation is not limited to the high pressure flash design. Nevertheless, Appellants believe the point to be moot, as the present claims where relying on Hanson '341 for support rely on the portions of Hanson discussing the high pressure flash design. Thus, while Appellants traverse the Examiner's contention that only a portion of Hanson is incorporated by reference, Appellants believe that where claim support is derived from Hanson '341, it is those portions of Hanson '341 dealing with the high pressure flash that are utilized.

Claim Support

In the Response to Arguments section of the Final Office Action, the Examiner stated that "the current pending claims are only support [sic] by the specification of the

current application [the present CIP] rather than fully supported by the specification of a parent, Hottovy (6,239,235), which includes the incorporated Hanson (US 4,424,341)." *See* Final Office Action, page 2 (emphasis in original). Thus, the Examiner asserted incorrectly that the present claims have the later filing date of the present CIP and not of the parent Hottovy 6,239,235. *See id.* at pages 2-3.

In apparent support of this position, the Examiner contended that "Hottovy's polymerization is limited to olefin polymer preparation rather than the unspecified 'solid polymer' of the instant claims." *See* Examiner's Answer, page 7. However, the Hottovy '235 olefin polymerization process *produces a solid polymer*. To be sure, based on the plain language of the present claims, the disclosure and context provided by the Hottovy '235 specification, and the ordinary meaning of "solid polymer" in the polyolefin art, the skilled artisan would reasonably conclude that Appellants had possession of the recited invention. *See, e.g.*, *Moba, B.V. v. Diamond Automation, Inc.*, 66 U.S.P.Q.2d 1429, 1438 (Fed. Cir. 2003) (explaining that for an applicant to satisfy the written description requirement, one skilled in the art need only reasonably conclude that the inventor had possession of the claimed invention in view of the specification); M.P.E.P. § 2163, page 2100-165 (Rev. 5, Aug. 2006); *see also Phillips v. AWH Corp.*, 75 U.S.P.Q.2d 1321, 1326 (Fed. Cir. 2005) (explaining that one should rely heavily on the written description for guidance as to the meaning of the claims). "The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation." *See Collegenet, Inc. v.*

ApplyYourself, Inc., 75 U.S.P.Q.2d 1733, 1738 (Fed. Cir. 2005) (quoting *Phillips* at 1326) (holding that derivation of a claim term must be based on "usage in the ordinary and accustomed meaning of the words amongst artisans of ordinary skill in the relevant art").

The Examiner also contended that "Hottovy together with Hanson '341 requires separation of the diluent vapor from the polymer slurry intermediate product in a flash tank first and then further separate [sic] the polymer particles entrained in the vapor by a cyclone rather than separating the polymer slurry intermediate product by centrifugal force in a cyclone as required by claims 1, 15, 28-31, 33, and 36." *See* Examiner's Answer, page 7 (emphasis in original). To the contrary, Hanson '341 states "there are many variations of the illustrated embodiment which fall within the scope of the invention." *See* Hanson '341, col. 4, lines 3-5. Appellants believe this accommodation of many variations, combined with the express example in Hanson of placing the cyclone 25 in the flash chamber 20, provides for processing of the polymer slurry intermediate product via the cyclone 25. *See* Hanson '341, col. 4, lines 9-12.

Appellants believe the processing of the intermediate product via a cyclone, as claimed, is supported by Hottovy '235 (and the incorporated Hanson '341). For example, claim 1 recites "separating the vapor from the *concentrated* intermediate product by centrifugal force in a cyclone," and claim 28 recites "separating vapor from the *heated* discharge slurry via centrifugal forces." (Emphasis added). It should noted that the intermediate product exits the upstream reactor, flashes across a continuous take-off

valve near the reactor discharge, and travels through a flash line prior to entering the flash chamber having the cyclone.

As the intermediate product (discharge slurry) exits the upstream flash line (which transports the intermediate product from the reactor), the *concentrated* intermediate product (or *heated* discharge slurry) consists primarily of solids and vapor with little or no liquid. Indeed, the intermediate product is subjected to heat and de-pressure as it travels through the flash line, and most or all of the liquid in the intermediate product exiting the reactor is vaporized across the upstream continuous take-off valve and in the flash line.

In this example, one of ordinary skill in the art would plainly understand that at least a significant portion of the concentrated intermediate product (heated discharge slurry) entering the flash chamber/cyclone is processed by a cyclone placed inside the flash chamber. Undeniably, this disclosed configuration supports the claim 1 recitation of "separating the *vapor* from the *concentrated* intermediate product by centrifugal force in a cyclone," and the claim 28 recitation of "separating *vapor* from the *heated* discharge slurry via centrifugal forces." (Emphasis added). Vaporization is not required in the flash chamber for the separating of vapor from the concentrated intermediate product (heated discharge slurry) via centrifugal forces or a cyclone.

It should be further noted that independent claim 37 is not limited to a cyclone or separation via centrifugal forces, but instead recites "separating a vapor from the heated discharge slurry in a *separator*." (Emphasis added). Appellants respectfully assert that the Examiner has not fully address the subject matter of claim 37.

Lastly, the Board is respectfully reminded that cited support for the present independent claims by the parent Hottovy '235 (having incorporated Hanson '341) was tabulated in the previously-submitted Appeal Brief. In conclusion, Appellants believe the cited Kendrick reference is not prior because the effective filing date of the present claims is the same as the parent Hottovy '235, and therefore, the foregoing rejection should be withdrawn.

Second Ground of Rejection - 35 U.S.C. § 103(a)

The Examiner also rejected claims 1, 15, 28-31, 33, and 36-42 under 35 U.S.C. § 103(a) as being unpatentable over Tormaschy et al. (EP 0 432 555 A2) in view of respectively Hanson (U.S. Patent No. 5,597,892) and Hanson '341.

Continuous Withdrawal

All independent claims 1, 28, and 37 recite a continuous withdrawal of slurry from the loop reaction zone. The Examiner relied on Tormaschy to teach this feature. However, Tormaschy is completely silent with regard to a continuous withdrawal (e.g., continuous take-off) of slurry from the loop reactor. *See, e.g.*, Tormaschy, page 5, lines

40-43; Figure 1. Indeed, based on the date of the reference, and on Appellants' understanding of the Tormaschy patent and the art at the time, Appellants stress the reactor systems contemplated by Tormaschy incorporated the typical settling leg configuration, and not a continuous withdrawal from the reactor. Moreover, the example in Tormaschy is generated via a pilot-scale developmental reactor. *See* Tormaschy, page 7, lines 43-44 and 49 (a 600 gallon reactor). Appellants know that this developmental reactor used to generate the Tormaschy example employed a cycling on/off intermittent discharge valve (*not* a continuous withdrawal). The on/off valve of this small developmental reactor is much different than a continuous withdrawal or a modulating continuous discharge valve, as presently claimed. In sum, Appellants strongly believe that the Tormaschy disclosure simply does not contemplate a continuous discharge from the loop reactor.

The previously-submitted Declaration of John D. Hottovy under 37 C.F.R. § 1.132 further clarifies that Tormaschy does not disclose or even contemplate a continuous withdrawal. Moreover, the two Hanson references (Hanson '341 and Hanson '892) do not obviate this deficiency of Tormaschy. Therefore, all claims are patentable over the cited combination. *See, e.g.*, Hanson '341 Figure 1 and col. 3, lines 5-7 (depicting a straight line and a valve for a discharge from the loop reactor, and labeling the configuration as settling leg 18).

It should be noted that Tormaschy is directed to measurement and control of solids in a loop reactor. *See* col. 5, lines 53-58. Again, the reference is completely silent with regard to a continuous withdrawal (e.g., continuous take-off) of slurry from the loop reactor, as recited in all independent claims. *See, e.g.*, Tormaschy, page 5, lines 40-42; Specification, page 2, ¶ 7. The reference merely mentions that "[t]he reactor effluent is withdrawn from reactor 11 through conduit 23 and is passed to the flash tank 25." *See* Tormaschy, page 5, lines 40-43; Figure 1. The conduit 23 is depicted as a straight line in Figure 1 with no accompanying text in reference that describes the nature of the slurry discharge or its design and operation. *See* page 5, lines 40-43 (failing to disclose a continuous take-off of the reactor slurry).

This is not surprising because, as mentioned, the reference is concerned with the measurement/control of solids concentration *in* the *loop reactor*, and makes no correlation between the design/operation of the reactor discharge with the proposed control of solids inside the loop reactor. *See* col. 5, lines 53-58. One would assume that if the reference contemplated a continuous discharge, the reference would at least address the modulating impact of a continuous discharge on the solids control-scheme proposed in the reference.

In sum, due to factors disclosed in the cited reference, such as the complexity of the proposed solids-control scheme, the disclosed manipulation of the reactor feed-stream (e.g., diluent feed) flow rates, the absence of discussion of the reactor discharge, the age

of the disclosed polyethylene process technology, and so on, it is plain that the reference can only contemplate a typical settling-leg discharge for reactors known in the art (and an intermittent on/off discharge valve for the developmental reactor) at the time of the filing of the reference. It is clear that all claims are patentable over Tormaschy for at least the reason that the reference does not disclose a continuous discharge.

Lastly, Appellants address related points in the Examiner's Answer. The Examiner asserted that "[a]pparently, Tormaschy's loop reactor is conducted in a *continuous mode* wherein the starting materials and diluent are introduced to the reactor at constant rates and the *product and diluent are withdrawn from the reactor at constant rates*." *See* Examiner's Answer, page 5, lines 15-17 (emphasis added). Similarly, the Examiner asserted that "in the polymerization conducted by Tormaschy's loop reactor, the starting materials and diluent are introduced to the reactor at constant rates and the product and diluent are withdrawn from the reactor at constant rates." *See* Examiner's Answer, page 8, lines 10-13 (emphasis in original). The Examiner concluded that "[o]ne of ordinary skill would have recognized that polymerization conducted in these kind [of] conditions is defined as a *continuous process*." *See id.* at 13 and 14 (emphasis added).

In response, Appellants first note that polyolefin production in loop reactor systems is generally considered a *continuous or continual process*. However, the discharge of the loop reactor has not traditionally been a continuous withdrawal. Instead the withdrawal from the reactor was traditionally a discontinuous or intermittent

discharge (e.g., settling leg or on/off discharge). Moreover, an intermittent discharge does not make a loop reactor system become a discontinuous or batch operation. Indeed, loop reactors have been operated with discontinuous discharges in a continuous (not batch) process for years. Appellants strongly disagree with the Examiner's characterization that because the Tormaschy system may be labeled as a continuous process that the discharge of the reactor must be continuous. Again, Appellants know that the Tormaschy reference only contemplated a discontinuous discharge from the loop reactor.

Second, Appellants strongly disagree with the Examiner's allegation that the "*product and diluent are withdrawn from the reactor at constant rates*" in Tormaschy. *See* Examiner's Answer, page 8, lines 12 and 13 (emphasis added); *see also* page 5, lines 16 and 17. Instead, the discharge rate (of the intermittent discharge) is an average rate over time. Further, while the point may be moot, starting materials and diluent are *not* necessarily fed to the reactor at constant rates, as alleged by the Examiner. *See id* at pages 5 and 8; *see also, e.g.*, Tormaschy, page 6, lines 45-56 (teaching varying the diluent feed rate to the reactor). Moreover, it should be noted that Appellants do not claim a constant rate of feed to the loop reactor. In addition, in a continuous process, rates may be varied, both of the feed streams to the reactor and of the discharge of the reactor.

Lastly, Appellants find it incredulous that the Examiner would treat (and rely) on the simplified representations of the figures in the cited art as engineering drawings depicting equipment details (such as the existence of valves). *See* Examiner's Answer, page 8, last 6 lines. The Examiner, in discussing Tormaschy, asserted confusingly and incorrectly that "in Fig. 1 where no valves are present in the [monomer and comonomer] lines because the starting materials are introduced to the reactor at constant rates (the synonym of continuous introduction)." To the contrary, Appellants believe the Tormaschy system substantially inoperable if no control valves were present in the monomer and comonomer feed lines.

Pressure Control via the Continuous Discharge

In addition, as discussed in the present specification and as claimed in independent claims 28 and 37, the recited continuous discharge is regulated to control pressure in the reactor, while maintaining generally constant the diluent feed rate to the loop reactor in steady-state, quite the opposite of the cited reference. *See* Tormaschy, Abstract (discussing manipulation of diluent flow rate); page 6, lines 45-56 (teaching varying the diluent feed rate to the reactor). Thus, because Tormaschy does not teach control of reactor pressure via a continuous discharge, it cannot anticipate claims 28 and 37, or their dependent claims for this additional reason.

Discharge Valve for Continuous Withdrawal

Furthermore, the reference fails to disclose a discharge valve for continuously withdrawing a slurry from the reactor, as recited in claims 28 and 37. This is also not surprising because the reference only contemplates a settling leg discharge (or a intermittent on/off valve of the developmental reactor). Thus, because Tormaschy does not teach or suggest a valve for continuous withdrawal of slurry, it cannot anticipate claims 28 and 37 for this additional reason.

Increase in Solids Concentration at the Discharge

Lastly, the Tormaschy reference also does not teach or suggest continuously withdrawing a slurry having an increase in solids concentration as compared with the slurry in the reactor, as recited in claims 28 and 37. *See* Tormaschy, col. 5, lines 53-58. The two Hanson references do not obviate this deficiency. Therefore, claims 28 and 37, and their dependent claims, are patentable over the cited combination for this reason as well. In view of the foregoing, Appellants respectfully request that the Examiner withdraw the rejection under 35 U.S.C. § 103 based on Tormaschy and Hanson '892, and allow the claims.

It should be noted that the Examiner stated that "as shown in the only figure of Hanson (5,597,892) and Fig. 1 of Hanson et al. (US 4,424,341), the withdrawn outlet of a loop reactor is located at the bottom of the loop reactor, the slurry withdrawn from the outlet of bottom of the reactor inherently contains higher concentration of solid die to

gravity." *See* Examiner's Answer, page 9. The Examiner concluded that "[t]herefore, one would have concluded such a feature also exist[s] in all of the cited references." *See id.* However, this point is moot. Indeed because the cited references teach a settling leg configuration, one would expect the discharge be located on a bottom of a lower leg, as depicted. *See, e.g.*, Hanson '341 Figure 1 and col. 3, lines 5-7 (depicting a a settling leg 18). However, it is not conventional in the art to locate a continuous take-off (CTO) discharge in such a location. Indeed, a CTO does not rely on static gravity as did a settling leg configuration.

Request Overturn of Rejection

For each of the reasons set forth above, Appellants respectfully request that the Board overturn the Examiner's rejection of independent claims 1, 28, and 37, as well as the claims that depend therefrom.

Conclusion

The foregoing are only reiterative points regarding the reasons why the pending claims are allowable. Appellants rely upon all of the reasons advanced in the Appeal Brief, and respectfully request that the Board carefully review the claims in view of these arguments and indicate the allowability of the claimed subject matter.

Respectfully submitted,

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